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DEPARTMENT OF COMMERCE

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FATALITIES IN TENNESSEE COAL MINES

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H. B. HUMPHREY AND F. E. CASH

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FATALITIES IN TENNESSEE COAL MINES[1]

By H. B. Humphrey[2] and F. E. Cash[3]

EXTENT AND PURPOSE OF REPORT

The Southern Appalachian coal field extends southward across Tennessee in a belt about 50 miles wide between the eastern and middle sections of the State. The earliest record of the production of coal in Tennessee is for 1840, and the first inspection laws were passed in 1881. In 1887, a second act of the legislature created the office of Chief Inspector, but little was done until 1891 when a new act was passed giving to the Department of Mines added duties and powers. Since that time, except for the years 1915 to 1918, comprehensive annual reports have been published. Data for the tables given in this paper are taken from these annual reports, from those of the Southern Appalachian Coal Operators' Association, and from the publications of the United States Bureau of Mines, which has maintained a station at Jellico, Tenn., since 1911. Complete figures for 1930 are not available yet and they are not included in the averages. The State Department of Mines, the operating companies, and the United States Bureau of Mines cooperate in accident-prevention work.

It is the purpose of this report to present in uniform tables the available statistics in regard to fatal accidents in Tennessee and in the coal mines of the United States, in order that the progress in mine safety in Tennessee may be compared with that of the country as a whole, and the present period may be compared with various periods of the past, to indicate the main points of attack in the reduction of accidents.

ACKNOWLEDGMENT

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FATALITY RATES

Table 1 lists the fatality rates for Tennessee and for the United States for the period 1891 through 1929 (figures for 1930 are not final). The deaths per million tons mined is an economic or cost factor which depends largely on efficiency of mining methods and labor, as well as on favorable or unfavorable natural conditions. The fatalities per million man-hours is a gage of the safety of the worker while at his work, and is unquestionably the fairest basis of comparison of accidents between different fields and different industries. The major disasters in Tennessee coal mines in 1895, 1901, 1902, 1911, and 1926 are responsible for the high rates of those years. Comparison of the rates for different periods of years given at the end of Table 1 shows a much higher rate for men killed per million tons of coal mined in Tennessee than in the United States. For the period 1891-99 the respective rates were 7.31 and 5.59; 1900:1909, 9.35 and 5.78; 1910-19, 5.40 and 4.53; and 1920-29, 4.23 and 3.82. A disaster during 1926 kept the averages for 1925 to 1929 above that of the United States. The rates for 1927 and 1928 are better than those of the United States, and in 1929 the death rate per million tons mined was 3.71 for Tennessee and 3.59 for the whole country. For the entire period 1891-1929, the respective rates were 6.31 and 4.65, showing that Tennessee's coal-mine safety record on a tonnage basis is by no means as good as the average of the coal mines of the United States.

The true measure of the hazard to the miner - men killed per million man-hours of exposure - shows Tennessee to have a slightly lower average than that of the United States, except for the years 1900 to 1909 during which period some of the worst disasters occurred. In 1891 to 1899 Tennessee had a rate of 1.47 men killed per million man-hours compared with 1.70 in the United States; in 1910 to 1919, 1.53 to 1.75; in 1920 to 1929, 1.56 to 1.83; and in 1925 to 1929, 1.80 to 1.85. For the entire period, Tennessee had a rate of 1.75 and the United States 1.83; the last three years give the former an average of 1.27 against 1.84; hence, on the basis of man-hours of exposure, Tennessee's coal mines have a slightly better safety record than the average for the coal mines of the United States as a whole, and the Tennessee coal-mine safety record on this basis was much better during the past three years than the record of the United States as a whole in coal mining.

Table 2 gives the production, man-hours, and tons per man-hour in the United States and in Tennessee for each year from 1891 to 1929, and for 10-year periods. Tennessee is much behind the remainder of the country in labor efficiency because of the general smaller thickness of beds and size of mine, and because of the irregular development and operation made possible by their being drift mines, so that work could be started and stopped at different points with small expense.

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Table 1.- Fatality rates in Tennessee and the United States since 1891, according to State and Federal statistics

Year	Killed per million tons		Killed per million man-hours	
	United States	Tennessee	United States	Tennessee
1891	6.06	9.13	1.68	1.83
1892	5.98	6.71	1.74	1.17
1893	5.39	6.83	1.57	1.18
1894	5.91	6.41	1.74	1.27
1895	6.00	14.67	1.83	3.23
1896	5.85	8.25	1.78	1.75
1897	5.07	3.47	1.65	0.75
1898	4.97	6.17	1.67	1.21
1899	5.08	5.38	1.72	1.14
1900	5.72	2.56	1.91	0.50
1901	5.40	11.61	1.80	2.37
1902	5.81	53.40	2.06	12.02
1903	5.47	5.41	1.75	1.26
1904	5.88	5.76	1.94	1.35
1905	5.78	5.22	2.01	1.18
1906	5.27	5.27	1.88	1.35
1907	6.78	4.46	2.65	1.21
1908	5.97	5.61	2.00	1.50
1909	5.73	4.98	2.20	1.35
1910	5.62	5.49	2.15	1.53
1911	5.35	17.21	2.02	4.61
1912	4.53	2.73	1.84	0.79
1913	4.89	5.19	2.07	1.39
1914	4.78	4.37	1.78	1.25
1915	4.27	4.37	1.69	1.37
1916	3.77	2.44	1.53	0.73
1917	4.14	4.54	1.75	1.25
1918	3.80	2.04	1.61	0.60
1919	4.19	5.18	1.77	1.48
1920	3.45	3.03	1.57	0.97
1921	3.94	3.23	1.74	1.09
1922	4.16	5.00	2.02	1.73
1923	3.74	3.57	1.82	1.01
1024	4.20	4.43	1.99	1.83
1925	3.84	4.83	1.93	1.82
1926	3.83	8.10	1.86	3.32
1927	3.72	2.86	1.82	1.15
1928	3.78	3.43	1.92	1.24
1929	3.59	3.71	1.78	1.35
1930	3.79	4.00	1.79	1.29
1891-1929	4.65	6.31	1.83	1.75
1891-1899	5.59	7.31	1.70	1.47
1900-1909	5.78	9.35	2.03	2.24
1910-1919	4.53	5.40	1.75	1.53
1920-1929	3.82	4.23	1.83	1.56
1925-1929	3.76	4.62	1.85	1.80
1900-1929	4.56	6.22	1.86	1.80

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Table 2.- Coal production and labor in United States and Tennessee coal mines since 1891

Year	Tonnage		Man-hours		Tons per man-hour	
	United States	Tennessee	United States	Tennessee	United States	Tennessee
1891	160,000,000	2,413,678	570,000,000	12,000,000	0.28	0.20
1892	166,000,000	2,092,064	570,000,000	12,000,000	0.29	0.17
1893	178,000,000	1,902,258	610,000,000	11,000,000	0.29	0.18
1894	165,000,000	2,180,879	550,000,000	11,000,000	0.30	0.19
1895	191,000,000	2,535,644	625,000,000	11,500,000	0.31	0.22
1896	186,000,000	2,663,106	610,000,000	12,500,000	0.31	0.21
1897	195,000,000	2,888,840	600,000,000	13,500,000	0.32	0.21
1898	214,000,000	3,084,748	640,000,000	15,640,000	0.33	0.20
1899	245,000,000	3,736,134	725,000,000	17,676,000	0.34	0.21
1900	265,000,000	3,904,048	778,500,000	20,000,000	0.39	0.20
1901	290,000,000	3,785,672	865,500,000	18,500,000	0.34	0.21
1902	300,000,000	4,232,332	918,400,000	18,830,000	0.33	0.22
1903	350,000,000	4,810,758	1,002,000,000	21,123,000	0.35	0.23
1904	345,000,000	4,847,242	1,032,000,000	20,826,000	0.34	0.23
1905	390,000,000	5,552,576	1,108,000,000	24,517,000	0.35	0.23
1906	410,000,000	6,272,457	1,135,000,000	24,470,000	0.36	0.26
1907	475,000,000	6,940,911	1,215,000,000	25,586,000	0.39	0.27
1908	410,000,000	6,082,851	1,222,000,000	22,560,000	0.33	0.27
1909	460,800,000	6,207,483	1,200,000,000	23,000,000	0.38	0.27
1910	501,596,378	6,908,688	1,305,000,000	24,820,000	0.38	0.28
1911	496,371,126	6,466,224	1,311,000,000	24,062,000	0.38	0.27
1912	534,466,580	6,578,754	1,311,000,000	22,568,000	0.41	0.29
1913	569,960,219	6,739,486	1,346,000,000	25,204,000	0.42	0.27
1914	513,525,477	5,943,258	1,378,437,219	20,665,000	0.40	0.29
1915	531,619,487	5,730,361	1,339,278,688	18,259,000	0.40	0.31
1916	590,098,175	6,137,449	1,452,788,095	20,565,000	0.41	0.30
1917	651,402,374	6,194,221	1,575,863,591	22,340,000	0.42	0.28
1918	678,211,904	6,831,048	1,599,853,614	23,509,000	0.42	0.29
1919	553,952,259	5,387,606	1,309,154,891	18,968,000	0.42	0.28
1920	658,264,932	6,921,848	1,451,162,000	21,560,000	0.45	0.32
1921	506,395,401	4,344,564	1,145,738,345	12,804,000	0.44	0.34
1922	476,951,121	5,209,911	979,994,880	15,016,000	0.48	0.35
1923	657,903,671	6,170,863	1,356,088,890	16,675,000	0.48	0.37
1924	571,613,400	4,750,754	1,207,474,560	11,992,000	0.48	0.40
1925	581,869,890	5,596,997	1,160,333,952	14,276,000	0.50	0.39
1926	657,804,437	6,089,162	1,352,840,229	15,015,000	0.48	0.40
1927	597,859,000	5,935,130	1,219,079,373	14,761,000	0.49	0.40
1928	576,093,000	5,545,762	1,135,542,452	14,512,000	0.51	0.39
1929	608,816,000	5,663,155	1,225,000,000	15,550,000	0.50	0.36
1930	531,432,000	5,103,000	(1)	(1)	(1)	(1)
1891-1929	16,891,038,000	195,278,922	42,639,000,000	709,046,000	0.40	0.28
1900-1929	15,919,038,000	171,781,571	37,139,000,000	592,230,000	0.41	0.29
1891-1899	1,700,000,000	23,497,351	5,500,000,000	116,816,000	0.31	0.20
1900-1909	3,696,000,000	52,636,330	10,477,000,000	219,412,000	0.35	0.24
1910-1919	5,571,204,000	62,917,095	14,429,000,000	220,960,000	0.39	0.28
1920-1929	5,873,442,525	56,228,146	12,233,255,000	151,850,000	0.48	0.37
1925-1929	3,002,618,000	28,830,206	6,092,796,000	74,115,000	0.49	0.39

(1) Data not available.

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Table 3 is a summary of the 10-year periods giving the production, fatalities, and tons per man killed in Tennessee and the United States. This is an inverted form of the rate per million tons mined, but is given as a common standard of comparison. The average tonnage per man killed in the United States from 1891 to 1929 was 215,000; in Tennessee it was 158,545. The United States shows an almost constant improvement from 182,000 tons per fatality in 1891-99 to 261,660 tons in 1920-29. In Tennessee, the figure varied from a low of 107,004 in 1900-1909 to 237,250 tons in 1920-29. The highest average for the United States was 290,000 tons in 1920, and for Tennessee was 487,932 tons in 1918. The lowest average for the United States was 144,000 tons in 1907, and for Tennessee was 18,727 tons in 1902. In 40 years (1891-1930) 80,463 fatal accidents were recorded in the coal mines of the United States; 1,258 of them in Tennessee. During 1891-1929, Tennessee produced 1.1 per cent of the coal in 1.6 per cent of the man-hours, with 1.6 per cent of the fatal accidents. The production per man-hour is 30 per cent below the average of the United States. In 1929, Tennessee produced 0.9 per cent of the coal in 1.2 per cent of the man-hours with 0.9 per cent of the fatal accidents. This is not the best record for any year, but it is at least better than the average. (See Table 5, following.)

Table 3.- Coal mined per man killed in the United States and Tennessee by 10-year periods

Period	Coal mined, tons		Men killed		Tons per man killed	
	United States	Tennessee	United States	Tennessee	United States	Tennessee
1891-1899	1,700,000,000	23,497,351	9,381	171	182,000	137,411
1900-1909	3,696,000,000	52,636,330	21,391	492	173,000	107,004
1910-1919	5,621,300,000	62,917,095	25,229	338	223,000	186,145
1920-1929	5,873,746,575	56,228,146	22,448	237	261,660	237,250
1925-1929	3,002,618,000	28,830,206	11,333	133	264,944	216,765
1927	597,859,000	5,935,130	2,224	17	268,821	249,125
1928	576,093,000	5,545,762	2,176	19	264,702	291,882
1929	608,992,000	5,663,155	2,181	21	279,226	269,676
1900-1929	15,191,038,000	171,781,571	69,068	1,067	220,000	160,995
1891-1929	16,891,038,000	195,278,922	78,449	1,238	215,000	158,545
1930	531,432,000	5,103,000	2,014	20	264,000	255,000

The low fatality rates on the basis of time exposure, which are marred here and there by explosion disasters, may be attributed to a good grade of steady native white labor which comprises the major part of the mine crews. Added to this have been the work of the State Mine Inspectors to induce safer practices, and of the Southern Appalachian Coal Operators' Association to reduce accidents in cooperation with the United States Bureau of Mines. Effective work toward safer and better practices is accomplished through a division of this association known as the Southern Appalachian Efficiency Association. The practices at some mines have been extremely unsafe, whereas others have to a large extent used practically all reasonable precautions.

Table 4 has the tonnage and time exposure ratings for five divisions of Tennessee mines for the years 1927, 1928, and 1929. The mines were divided into these five classes on the basis of yearly production, and the rates calculated for the 3-year average to determine what difference in hazards there might be between mines of different production capacity, as shown by the fatal accidents.

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Class I is made up of mines producing 10,000 tons or less a year; the number of openings is decreasing—from 32 in 1927 to 18 in 1929. Only two fatal accidents were recorded, both in 1929; for the 3-year period this gives a high fatality rate for the tonnage produced, but an average rate for the time worked of 1.20 per million man-hours; this shows low efficiency in labor, high accident cost per ton, but average safety for the individual.

Class II, mines producing 10,000 to 50,000 tons a year, increased in number from 17 in 1927 to 28 in 1929, with double the tonnage and working hours. Five fatal accidents were recorded in 1927, none in 1928, and five in 1929; for the three years the average rate per million tons was 5.22 and 1.52 per million man-hours. The labor efficiency in this group is about double that of class I, yet it is only 75 per cent of that in the larger mines. Probably, safety receives less attention in this class of mines than in the others.

Class III, mines producing 50,000 to 100,000 tons a year, has the best record. With 15 mines in 1927, 17 in 1928, and 19 in 1929, only 2.10 fatalities are recorded per million tons and 0.88 per million man-hours. Evidently, this size of mine is favorable to safe and efficient operation.

Class IV, mines producing 100,000 to 200,000 tons a year, declined from 16 mines in 1927 to 11 in 1928 and 1929. Their record is slightly better than the average of all, being 3.13 per million tons and 1.17 per million man-hours.

Class V, comprising the largest mines in the State, numbered 8 in 1927, 9 in 1928, and only 6 in 1929. Their efficiency was good in 1927 and 1928, somewhat lower in 1929, but still ahead of the other groups. Their fatal accidents increased from 6 in 1927 to 7 in 1928 and to 8 in 1929, with fewer mines in 1929 than in 1927 or 1928, and fewer mines in 1927 than in 1928.

For all mines both ratings are higher in 1928 than in 1927, and still higher in 1929.

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Table 4.- Fatality rates in Tennessee mines during 1927, 1928, and 1929

Year	Mines	Tons	Hours	Killed	Rate per million Tons	Rate per million Man-hours	Tons per man-hour
CLASS I - UNDER 10,000 TONS							
1927	32	91,135	650,000	0			0.14
1928	23	75,147	638,000	0			0.12
1929	18	59,391	383,000	2			0.15
3 years		225,673	1,671,000	2	9.00	1.20	0.14
CLASS II - 10,000 TO 50,000 TONS							
1927	17	435,754	1,399,000	5			0.31
1928	24	605,549	2,118,000	0			0.29
1929	28	877,860	2,958,000	5			0.29
3 years		1,919,163	6,575,000	10	5.22	1.52	0.29
CLASS III - 50,000 TO 100,000 TONS							
1927	15	1,074,159	2,730,000	1			0.37
1928	17	1,236,054	2,555,000	5			0.48
1929	19	1,508,060	3,821,000	2			0.40
3 years		3,818,273	9,106,000	8	2.10	0.88	0.42
CLASS IV - 100,000 TO 200,000 TONS							
1927	16	2,234,800	5,322,000	5			0.42
1928	11	1,324,255	4,025,000	7			0.33
1929	11	1,545,253	4,334,000	4			0.36
3 years		5,104,308	13,681,000	16	3.13	1.17	0.37
CLASS V - 200,000 TO 500,000 TONS							
1927	8	2,099,282	4,600,000	6			0.46
1928	9	2,304,757	4,864,000	7			0.47
1929	6	1,672,591	4,054,000	8			0.41
3 years		6,076,630	13,518,000	21	3.43	1.55	0.45
TOTALS - ALL MINES							
1927	88	5,935,130	14,701,000	17	2.86	1.16	0.40
1928	84	5,545,762	14,260,000	19	3.43	1.33	0.39
1929	82	5,663,155	15,550,000	21	3.71	1.35	0.36
3 years		17,144,047	44,511,000	57	3.33	1.28	
1930		5,103,000	(1)	20	(1)	(1)	(1)

(1) Data not available.

CAUSES OF FATAL ACCIDENTS

Table 5 is a compilation of the fatal accidents in Tennessee since 1891 by cause and giving the yearly total for the United States. For the years in which the State mine inspectors' reports were published the total of nonfatal accidents reported in Tennessee is also given; these State reports and bulletins of the United States Bureau of Mines were used as the basis for making up this table.

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Before 1904, the nonfatal accidents reported were about three times the fatalities, indicating that a greater number of accidents were fatal in those days, or more probably that the nonfatal accidents were not as completely reported as they were later. Since that time the proportion appears to be about 5 to 1. These are lost-time reportable accidents.

Table 5.- Yearly fatalities in Tennessee by causes

Year	Falls	Haulage	Electricity	Machinery	Explosives	Gas and dust	Miscellaneous	Total		Reported nonfatal,
								Tennessee	United States	Tennessee
1891	13	3	-	-	4	2	-	22	956	45
1892	11	1	-	-	3	-	-	14	991	15
1893	6	4	-	-	1	-	2	13	958	58
1894	12	1	-	1	-	-	-	14	958	30
1895	7	-	-	-	2	28	-	37	1,142	111
1896	18	1	-	-	3	-	-	22	1,083	25
1897	10	-	-	-	-	-	-	10	990	35
1898	14	2	-	-	1	1	-	19	1,062	77
1899	13	4	-	-	1	1	-	20	1,241	74
1900	9	-	-	-	1	-	-	10	1,492	33
1901	17	4	-	1	1	20	1	44	1,549	89
1902	18	5	-	-	3	200	-	226	1,895	103
1903	15	8	1	-	2	-	-	26	1,752	70
1904	19	4	-	-	1	4	-	28	2,004	129
1905	18	3	1	-	7	-	-	29	2,232	147
1906	20	6	-	-	2	1	4	33	2,138	210
1907	20	4	2	-	1	3	1	31	3,242	195
1908	27	2	4	-	1	-	-	34	2,445	195
1909	18	5	2	1	2	1	2	31	2,642	197
1910	22	4	2	-	7	3	-	38	2,821	210
1911	14	8	4	-	1	84	-	111	2,656	198
1912	14	3	-	-	1	-	-	18	2,419	118
1913	26	6	1	-	-	1	1	35	2,785	119
1914	21	3	-	-	1	1	-	26	2,454	129
1915	15	4	2	-	3	1	-	25	2,269	-
1916	9	3	3	-	-	-	-	15	2,226	-
1917	12	2	1	1	-	12	-	28	2,696	-
1918	10	3	1	-	-	-	-	14	2,580	-
1919	18	7	-	-	1	2	-	28	2,323	150
1920	15	5	-	-	-	1	-	21	2,272	175
1921	8	3	1	1	1	-	-	14	1,995	125
1922	17	3	2	1	-	1	2	26	1,984	110
1923	9	7	1	-	2	3	-	22	2,462	175
1924	7	5	2	-	2	3	2	21	2,402	160
1925	10	3	-	-	1	13	-	27	2,234	210
1926	14	4	1	-	3	27	-	49	2,518	250
1927	10	3	3	1	-	-	-	17	2,224	200
1928	9	5	1	-	4	-	-	19	2,176	200
1929	15	5	1	-	-	-	-	21	2,181	125
1930	16	3	-	-	1	-	-	20	2,014	130
1891-1929	560	143	36	7	63	413	16	1,238	78,449	-
1900-1929	456	127	36	6	48	381	13	1,067	69,068	-

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From 1891 to 1929, the division of fatal accidents according to cause has been as given in Table 6.

Table 6.- Fatal accidents in Tennessee by causes

Cause	Tennessee		United States
	Past 39 years, per cent	Past 3 years, per cent	10 years, per cent
Falls of rock and coal	45.3	59.5	52.0
Haulage	11.6	22.8	19.0
Electricity	2.9	8.8	5.2
Machinery	0.5	1.8	1.9
Explosives	5.1	7.1	5.3
Gas and dust explosions	33.3	0.0	11.9
Miscellaneous	1.3	0.0	4.7
Total	100.0	100.0	100.0

Discussion of Causes

Falls of rock and coal in Tennessee bear essentially the same relation to the total as exists for the whole United States; the high percentage of the last three years was due to the absence of explosion fatalities, leaving the others larger in respect to the total. Workers at an average of 14 per year have been killed by falls of rock and coal since 1891, so that any number of fatalities below this may be considered an improvement. This is a form of accident which can be reduced by strict inspection, scaling of loose material, and timbering, with constant supervision by foremen. The deaths from haulage average four a year, and are now approximately 20 per cent of the total. Electricity causes about 8 per cent of the fatalities, with the prospect of inducing a greater number as more power is used in the mines. Explosives account for about 5 per cent, which is on a par with the remainder of the country. The average is about two a year—much too high now that 65 per cent of the explosives used are of permissible type and not black powder as before 1906, and also now that the coal is being undercut before shooting. As the remainder of the accidents of this type are due to improper handling and carelessness, they can and should be eliminated. Over the whole period from 1891, explosions have been responsible for one-third of the deaths in Tennessee coal mining. The average for the United States for the last 10 years is less than 12 per cent. Tennessee lost 27 lives in an explosion in 1926, but has had a "clean slate" since that year. Only a few of the mines in Tennessee are gassy; many are naturally wet, so that with reasonable care in the use of electricity and proper precautions in ventilation and blasting, explosions in the future can be made a rarity. The use of rock-dust for safety and as an aid to illumination where not practised should be given serious consideration, because widespread explosions are preventable, and rock-dusting together with proper ventilation is one of the chief means of prevention.

In Table 7, fatal accidents in Tennessee for the years 1927, 1928, and 1929 are classified by causes and according to the size of the mine in which they occurred. Mines in Class I, with production of less than 10,000 tons per year, have the highest percentage of fatalities in proportion to the percentage of tonnage mined; this is in accord with data from other States also. Class III mines, with annual production of 50,000 to 100,000 tons,

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have the most favorable records. Rock falls were responsible for both fatalities in Class I, for 8 of 10 fatalities in Class II, 3 of 8 in Class III, 12 of 16 in Class IV, and for 9 of 21 in Class V. This means that falls are the major source of accidents in all mines of this State, and that in the larger mines causes are more varied than in the smaller mines. Among these other causes is haulage, which is charged with four deaths in Class II (all of these deaths occurred at one time, and this, of course, is not a general condition), but with seven in Class V; these fatalities point the way to a needed reduction of haulage accidents through more general observance of recognized safe practice in haulage. The more progressive mines in Tennessee have efficient haulage with relatively few accidents. From the record of the last three years the danger from electrocutions lies in Class IV mines, which accounted for three accidents of five of this type for all classes. As the use of electric power is extended, electrocutions will increases unless proper safeguards are provided as part of the installation and use of electricity, with no toleration of temporary "layouts," or of any but the safest practices. The four deaths charged to explosives in 1928 were caused at one time by careless handling of black powder, which has no place in safe coal mining.

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Table 7.- Causes of fatalities in Tennessee by classes of mines during 1927, 1928, and 1929

Year	Rock falls	Haul-age	Elec-tricity	Machinery	Explo-sives	Gas and dust	Miscel-laneous	Total	Mines	Tonnage, per cent	Fatal, per cent
CLASS I - UNDER 10,000 TONS											
1927	-	-	-	-	-	-	-	0	32	1.5	0.0
1928	-	-	-	-	-	-	-	0	23	1.4	0.0
1929	2	-	-	-	-	-	-	2	18	1.1	9.5
1930	1	-	-	-	-	-	-	1	-	-	-
Average	-	-	-	-	-	-	-	1	-	1.3	3.2
CLASS II - 10,000 TO 50,000 TONS											
1927	4	-	1	-	-	-	-	5	17	7.4	29.4
1928	-	-	-	-	-	-	-	0	24	10.8	0.0
1929	4	1	-	-	-	-	-	5	28	15.5	23.8
1930	1	-	-	-	-	-	-	1	-	-	-
Average	-	-	-	-	-	-	-	-	-	11.2	14.4
CLASS III - 50,000 TO 100,000 TONS											
1927	1	-	-	-	-	-	-	1	15	18.2	5.9
1928	-	4	1	-	-	-	-	5	17	22.2	26.4
1929	2	-	-	-	-	-	-	2	19	26.7	9.5
1930	2	-	-	-	-	-	-	2	-	-	-
Average	-	-	-	-	-	-	-	-	-	22.3	13.9
CLASS IV - 100,000 TO 200,000 TONS											
1927	2	1	2	-	-	-	-	5	16	37.5	29.4
1928	7	-	-	-	-	-	-	7	11	23.7	36.8
1929	3	-	1	-	-	-	-	4	11	27.1	19.1
1930	9	-	-	-	-	-	-	9	-	-	-
Average	-	-	-	-	-	-	-	-	-	29.4	28.4
CLASS V - 200,000 TO 500,000 TONS											
1927	3	2	-	1	-	-	-	6	8	35.3	35.3
1928	2	1	-	-	4	-	-	7	9	41.9	36.8
1929	4	4	-	-	-	-	-	8	6	29.6	38.1
1930	3	-	-	-	-	-	-	3	-	-	-
Average	-	-	-	-	-	-	-	-	-	35.6	36.7
ALL MINES											
1927	10	3	3	1	-	-	-	17	88	100.0	100.0
1928	9	5	1	-	4	-	-	19	84	100.0	100.0
1929	15	5	1	-	-	-	-	21	82	100.0	100.0
1930	16	3	-	-	1	-	-	20			

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NONFATAL ACCIDENTS IN 1930

During 1930, 490 lost-time accidents were reported to the Southern Appalachian Coal Operators' Association, compared with 690 in 1929. Table 8 lists 130 of these accidents, which include everything from a mashed finger to a broken leg and are probably a representative group of those of which a record was obtained.

Fifty-six of these lost-time accidents were from falls of slate and coal, 50 of which were sustained by miners and loaders; the remainder was scattered among all classes of workers. This gives an indicated proportion of 90 per cent of falls happening at the face.

Haulage is charged with 36 of the total of 130 lost-time accidents. Nineteen were accidents to miners and loaders, 3 to motormen, and 11 to couplers. The miners and loaders are injured in handling cars from the entry to the face, due chiefly to low top and insufficient clearance. A coupler's job is a hazardous one under present haulage practice, where work is demanded at high speed and usually with poor track, equipment, clearance, and lighting.

There were 10 accidents from mining machines and three from explosives. It would seem that accidents of these two classes are due chiefly to carelessness and could be prevented by proper care and rigid efficient supervision.

Many lost time injuries from tools were reported—16 out of 130 such accidents; the explanation seems to be that many eye injuries occurred from picking rock and coal, and many persons were hurt by striking the hand or foot with ax or pick. Goggles can be used to prevent the eye injuries, and the hand and foot injuries can at least be materially decreased in number and severity by careful inspection and instruction and by the wearing of safety shoes.

Table 8.- Reported non-fatal accidents in Tennessee during 1930

Occupation	Falls	Haulage	Electricity	Machinery	Explosives	Gas and dust	Tools	Miscellaneous	Total
Miner and loader	50	19	0	1	3	0	10	1	84
Machine man	1	0	1	4	0	0	1	0	7
Machine helper	1	0	0	4	0	0	0	1	6
Motorman	0	3	0	0	0	0	0	0	3
Coupler	0	11	0	0	0	0	0	0	11
Trackman	1	1	0	0	0	0	2	1	5
Driver	1	0	0	0	0	0	1	1	3
Pumpman	0	0	0	0	0	0	1	1	2
Mechanic	1	0	0	1	0	0	1	1	4
Car trimmer	0	1	0	0	0	0	0	2	3
Face boss	0	1	0	0	0	0	0	0	1
Safety man	1	0	0	0	0	0	0	0	1
Total	56	36	1	10	3	0	16	8	130

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CONCLUSION

Apparently, operations in Tennessee range from poorly managed properties with extremely unsafe practices, many of which somehow escape accident, to well-regulated and reasonably safe mines. Favored as they are by natural conditions, the men in charge of the mines in this State can make a fatal accident a rare occurrence and other types of accidents relatively few by the installation of safe and efficient equipment, and insistence on its proper upkeep and use. By such means the cost of production is lowered and the worker is protected in the enjoyment of his life and health.

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